

SpotView

Newsletter # 4

Starting result dissemination and technology demonstration in industry

The SpotView project, started in October 2016, successfully passed its 1st periodic review at M18 and ended its second year with a 1st Workshop held in Avilés (Spain) on October 4th, presenting the results obtained so far. Most technologies and innovative solutions developed for improving resource efficiency of industrial processes (Steel, Paper and Dairy products) have been successfully assessed at laboratory or pilot scale in realistic environment. The innovative strategies frequently combine existing or new technologies including: aerobic or anaerobic biological treatment, microflotation, membrane separation (from micro to nanofiltration), electrolysis or capacity deionization.

The technologies are applied for recycling industrial process water or for purifying alternative water resources such as rain water or rejects from effluent treatment plants.

The recovery of valuable substances (proteins, glucides) is also assessed to bring additional value to the water treatment. Industrial integration of these new treatment and separation technologies will be now simulated on process models from the three sectors or demonstrated in real industrial environments. Environmental footprint assessment and exploitation strategies for selected technologies will help to maximize the impact of the project.

Eric FOUREST

Zoom on Methodologies

- > CTP / Kadant / Starch recovery in paper and board industry
- > VTT / Xerchem / On-site generation of biocides from paper mill process waters
- > BFI / Arcelor / Innovative water treatment to reuse backwash water in the steel Industry
- > CTP / Saica / Essity / Effluent reuse for fresh water reduction in the Pulp and Paper Industry



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Starch recovery in paper and board industry!



During the pulping of recovered papers and boards a fraction of the starch contained in fibres is extracted in process water. Starch is hydrolysed by bacteria in volatile fatty acids responsible for degradation of process runability and product characteristics. The recovery of starch limits bacterial activities and could lead to starch reuse strategies.

Two stages were considered:

- Pulp washing stage for extracting soluble and colloidal starch with a thickener.

- Organic concentration stage, through dissolved air flotation, filtration or centrifugation, to recover starch and reuse the water.

Laboratory scale tests in realistic conditions has shown that this technology assembly makes it possible to recover 30% of the starch released in pulping process water. This approach is subject of a patent application. Its demonstration at pilot scale will be realized in 2019.

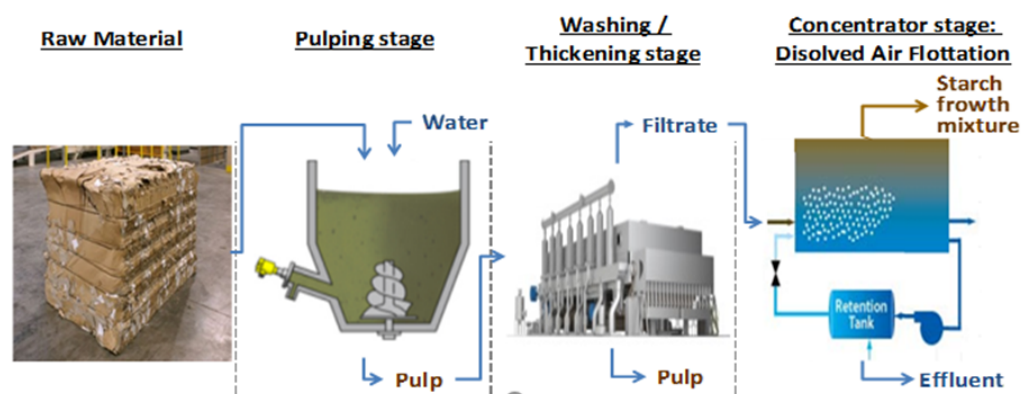


Figure: Process integration of starch recovery in the pulp and paper industry

Onsite generation of biocides from paper mill process waters



The Biocontrol solution aims at developing a business credible concept by combining membrane technology and electrolysis to replace existing biocides.

When using paper machine's white water for on-site biocide production by electrolysis, purification and concentration are needed to reduce the amount of detrimental organic compounds and maximize the chloride concentration. Lab scale trials indicated that after white water purification by NF mem-

branes, either conventional or novel membrane technologies (forward osmosis (FO) and membrane distillation (MD)) are suitable for chloride concentration before sodium hypochlorite production by electrolysis. MD is an option if waters with different temperatures are available at mill site. In the case of FO the availability of suitable high osmotic pressure draw solution is required. The concept obtained at lab-scale will be verified and developed further at pilot-scale.

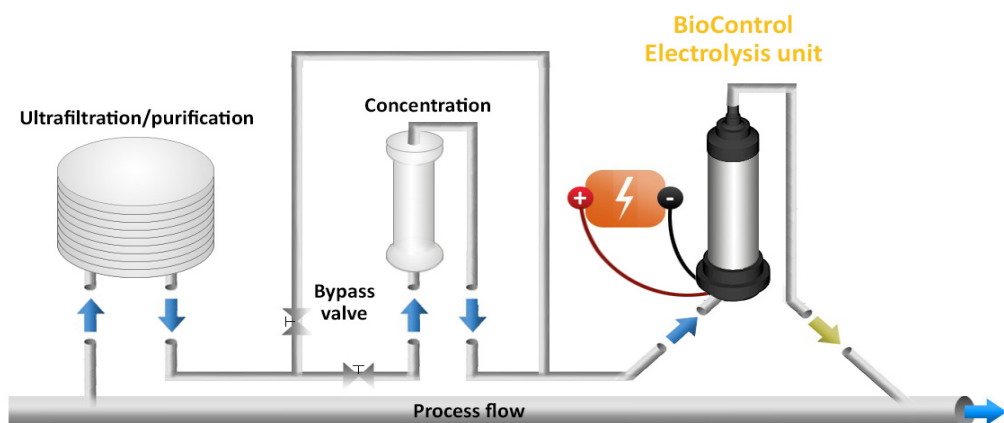


Figure: Process diagram of Biocontrol pilot-scale installation.

Innovative water treatment to reuse backwash water in the steel industry!

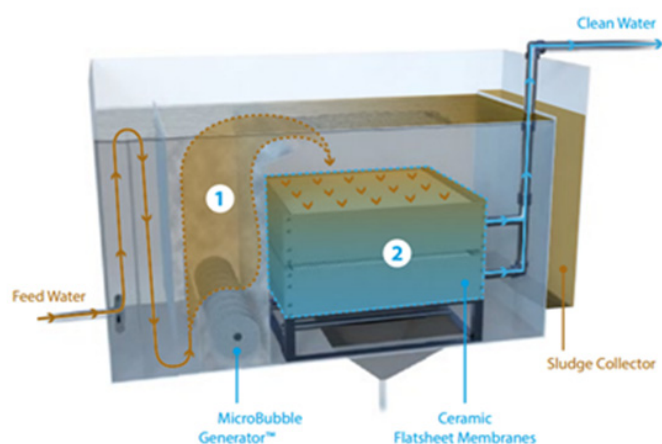
Filter backwash water was selected to be recycled into the steel process with a double aim: water quality improvement and fresh water saving. Innovative treatment technologies were assessed:

1/ **low footprint pretreatment** combining flotation with submerged microfiltration to

remove suspended solids (TSS), oils, grease and turbidity;

2/ **Capacitive Deionization (CDI)** for decreasing the salinity of the water. The microfiltration is done with flat sheet ceramic membranes (0.1 μm pore size) that are robust and chemically resistant.

To validate industrially the technology, a pilot plant (capacity 5 m³/h) was tested under industrial conditions. The pretreated water quality fulfills the desalination technology requirements: TSS < 10mg/L, turbidity below 1 NTU, SDI < 5 and oils and grease below 5 mg/L. The water volume recovered is up to 94%. CDI demonstration trials are planned to validate this technology in the industrial site.



*Scheme of the pilot plant from akvola technology
(1) Flotation chamber (2) Microfiltration*

Effluent reuse for fresh water reduction in the Pulp and Paper Industry!

During the last decades, the Paper Industry has drastically decreased its fresh water use by recycling process waters. The next step is to reuse the effluents from the waste water treatment plant. These effluents are free of suspended solids and reduced in organic matters but inorganics salts remain. Paper Industry has to deal with it to go further on water circuits' closure.

In Spotview, a new method to predict the consequences of ions increase in process waters has been developed. It includes lab trials assessing additives efficiency in high conductivity levels; and simulation tool to identify bio-treated effluent reuse points, to decide on a tertiary treatment necessity and to estimate the fresh water reduction potential.

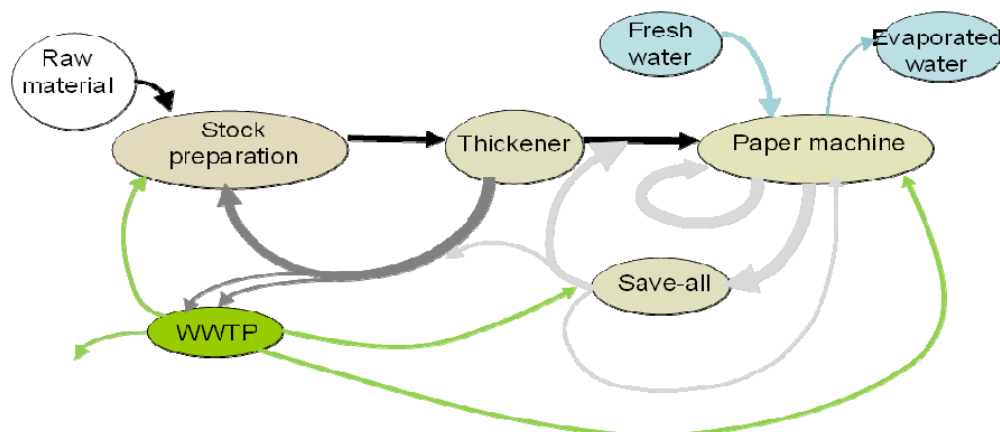


Figure: Process water and effluent recycling loops in paper manufacturing

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SPOTVIEW EVENT

WORKSHOP 4th October 2018, in Avilès (Spain).

A big success for the 1st workshop of Spotview...

“SpotView is one of the best performing project promoted by SPIRE “, announced Mihai Bardanescu, SPIRE program manager, opening the **First Workshop of the project**.

Many partners, industrialists and experts made the trip! Including Spanish National Television (RTPA-A7).



The Workshop, held in **Avilès Niemeyer Center on October 4th**, brought together more than 50 persons from industry and research organizations, to discover the first outcome presented by the SpotView partners after one year of R&D effort. Let's meet in 2020, at the end of the project, to see how the new technology applications will help the industrial sectors (Steel, Paper, Dairy), to reach the objectives of water and carbon footprint reduction...

Asturias / Industria

Escuchar

Fuente: RTPA, 4 de octubre. 2018 13:10

Expertos analizan en Avilés el uso eficiente del agua en la industria



Visit the website to discover the video !


More information is available on **SpotView** public website

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